IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number:	10/804,688
Filing Date:	03/19/2004
Applicant(s):	Brent L. Davis, Peeyush Jaiswal, Alan P. McDonley Vanessa V. Michelini
Entitled:	SPEECH DISAMBIGUATION FOR STRING PROCESSING IN AN INTERACTIVE VOICE RESPONSE SYSTEM
Examiner:	Abul K. Azad
Group Art Unit:	2626
Attorney Docket No.:	BOC920030059US1 (1082-024U)

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed February 19, 2008. This Appeal Brief has been timely filed within the shortened statutory period of two months from the date of the filing of the Notice of Appeal, an extension of time under 37 C.F.R. § 1.136 is not required. Notwithstanding, please charge any shortage in fees due under 37 C.F.R. §§ 1.17, 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-3839, and please credit any excess fees to such deposit account.

Date: April 21, 2008

Respectfully submitted,

/Steven M. Greenberg/
Steven M. Greenberg, Registration No. 44,725
Customer Number 46322

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number:	10/804,688
Filing Date:	03/19/2004
Applicant(s):	Brent L. Davis, Peeyush Jaiswal, Alan P. McDonley Vanessa V. Michelini
Entitled:	SPEECH DISAMBIGUATION FOR STRING PROCESSING IN AN INTERACTIVE VOICE RESPONSE SYSTEM
Examiner:	Abul K. Azad
Group Art Unit:	2626
Attorney Docket No.:	BOC920030059US1 (1082-024U)

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed February 19, 2008, wherein Appellants appeal from the Examiner's rejection of claims 1 through 19.

I. REAL PARTY IN INTEREST

This application is assigned to International Business Machines Corporation by assignment recorded on March 19, 2004, at Reel 015122, Frame 0750.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1 through 19 are pending in this Application and have been twice rejected. It is from the multiple rejections of claims 1 through 19 that this Appeal is taken.

IV. STATUS OF AMENDMENTS

The claims have not been amended subsequent to the imposition of the Final Office Action dated November 16, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 9 and 12 are respectively directed to a method for processing string input for a field in an interactive voice response (IVR) system, an IVR system, and a machine readable storage having stored thereon a computer program for processing string input for a field in an IVR system. In Appellants' invention as described specifically in Par. [0015] and [0016] of Appellants' published specification, one or more fields within an interface managed by the IVR system can be processed to identify a subset of input for the field which enjoys a higher likelihood of pattern recognition. Specifically, the string can be inspected to identify a subset consisting of numbers, letters or both which enjoys a higher likelihood of accurate speech recognition than other numeric characters, alphabetic characters, and alphanumeric characters in the string. Similarly, the string can be inspected to identify a pattern of numeric characters, alphabetic characters, and alphanumeric characters which are more likely to be uniquely identified among a database of strings than other numeric characters, alphabetic characters, and alphanumeric characters.

Once a subset has been identified for the strings associated with the field, interacting users can be prompted to complete the field not by specification of the entire string associated with the field, but with a mere subset of the string associated with the field. As the subset will have been chosen to enhance both the likelihood of speech recognition and unique identification, the IVR system can more efficiently match the provided input to existing data for the field without requiring the use of exhaustive levels of prompting for complete string input. In this regard, the provided user input can be disambiguated from other possible matching data without subjecting the user to unnecessary prompts.

With respect specifically to claim 1, a method for processing string input for a field in an IVR system includes identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition. (Par. [0025]) Specifically, the sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0025]) The method also includes prompting an interacting user for string input limited to the sub-string pattern. (Par. [0026]) Yet further, the method includes matching received sub-string input conforming to the sub-string pattern with data which conforms to the acceptable input to locate the string input for the field. (Par. [0026]) Finally, the method includes completing the field with the matched data. (Par. [0026]).

With respect specifically to claim 9, an IVR system includes at least one form including at least one field which can be completed using input received through the IVR system. (Figure 1, Element 160) The system also includes a sub-string analyzer coupled to the IVR system.

(Figure 1, Element 190) Finally, the system includes a search processor (Figure 1, Element 180) coupled both to the IVR system and a database of data configured for searching based upon sub-strings which match sub-string patterns produced by said sub-string analyzer. (Figure 1, Element 170) In this regard, the sub-string patterns exclusively contain a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0019]) Consequently, the field is completed using data matched in the database with the search processor using sub-string input provided through the IVR system. (Par. [0023])

Finally, with respect specifically to claim 12, a machine readable storage can be provided to have stored thereon a computer program for processing string input for a field in an IVR system. The computer program includes a routine set of instructions which when executed by a machine cause the machine to identify a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition. (Par. [0025]) Specifically, the sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field. (Par. [0025]) The routine set of instructions when executed by the machine also cause the machine to prompt an interacting user for string input limited to the sub-string pattern. (Par. [0026]) Yet further, the routine set of instructions when executed by the machine cause the machine to match received sub-string input conforming to the sub-string pattern with data conforms to the acceptable input to locate the string input for the field. (Par. [0026]) Finally, the routine set of instructions when executed by the machine cause the machine to complete the field with the matched data. (Par. [0026])

VI. ISSUES TO BE REVIEWED ON APPEAL

1. Claims 1-19 are not anticipated by United States Patent No. 6,725,197 to Wupperman et al. (Wupperman).

VII. THE ARGUMENT

THE REJECTION OF CLAIMS 1 THROUGH 19 UNDER 35 U.S.C. § 102(B) AS BEING ANTICIPATED BY WUPPERMAN.

For convenience of the Honorable Board in addressing the rejections, claims 2 through 8 stand or fall together with independent claim 1, claims 10 through 11 stand or fall together with independent claim 9, and claims 13 through 19 stand or fall together with independent claim 12.

In the Final Office Action, Examiner sustained Examiner's rejection of claims 1 through 19 based upon the Wupperman reference. Exemplary claim 1 as amended reads as follows:

> 1. A method for processing string input for a field in an interactive voice response (IVR) system, the method comprising the steps of:
>
> identifying a sub-string pattern of characters within acceptable input for the field **which is known to enjoy a high likelihood of recognition**, the sub-string pattern of characters exclusively containing **a sequence of characters appearing amongst all characters for the acceptable input for the field**;
>
> prompting an interacting user for string input limited to said sub-string pattern;
>
> matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,
>
> completing the field with said matched data.

Elemental to Claim 1 as originally presented, is the identification of a sub-string pattern of characters within acceptable input for a field which is known to enjoy a high likelihood of recognition. Further, integral to amended claim 1 is the sub-string pattern of characters

exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field.

Wupperman fails to provide either of these teachings. The Examiner relies exclusively upon column 5, line 38 to column 6, line 6 of Wupperman in support of Examiner's rejection. The entirety of the cited portion of Wupperman is reproduced herein for the convenience of the Honorable Board:

> When the adapted network grammar in accordance with FIG. 2 is used as a linguistic speech model, the speech recognition unit 2 again carries out a speech recognition operation for the character vectors which are stored and derived from the originally entered spelled speech utterance "**AACHEN**", which in its turn leads to the recognition result "**AADAEM**". After "A" was proposed to the user for the second letter and this recognition result was also acknowledged as correct by the user, again an adaptation of the linguistic speech model used i.e. of the network grammar is made while the database information is used. After the adaptation, there is a network extension to four nodes K0, K1, K2 and K3, which is represented in FIG. 3. In accordance with the sequence "AA" as acknowledged initial letters, they are assumed to be known, so that both between the nodes K0 and K1 and between the node K1 and the node K2 only one edge is assumed to which is assigned a state corresponding to the letter "A". In accordance with the respective database information the number of permissible letters for the third letter of the place name to be recognized now contains only the letters "C", "L", "R" or "S". The FIG. 3 shows respective edges between the two nodes K2 and K3, while for clarity again only one edge is drawn for the two neighboring letters "R" and "S". This adapted network contains no (constraining) information about the fourth and possibly further letters of the speech utterance to be recognized.
>
> With the re-modified linguistic speech model (=network grammar), a further speech recognition operation is carried out by means of the speech recognition unit 2, for which again the stored character vectors of the originally detected spelled speech utterance "AACHEN" are started from. This time, however, an improved recognition result "AACHEM" is produced on the basis of the modified linguistic speech model, which result only slightly differs from the actual speech utterance.

It will be plain to the Honorable Board that the cited portion of Wupperman wholly lacks a teaching directed to the identification of a sub-string pattern of characters within acceptable input for a field which is known to enjoy a high likelihood of recognition. While the Examiner has not specifically pinpointed where within the cited portion reproduced above such a teaching is believed to have been found, a line by line review of the cited portion reveals no such teaching. Further, the cited portion does not teach the identification of a sub-string pattern of characters

wherethe sub-string pattern of characters exclusively contains a sequence of characters appearing amongst all characters for the acceptable input for the field.

Examiner states otherwise in the Final Office Action dated November 16, 2007. Specifically, Examiner states,

> The Wupperman reference teaches, identifying a sub-string pattern ("AA") of characters within acceptable input ("AACHEN") for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters ("AA") appearing amongst all characters ("AACHEN") for the acceptable input for the field" (col. 5, line 38 to col. 6, line 6). The applicant has misinterpreted the word "string" and "sub-string", here "acceptable input" is input string 'AACHEN" and "identifying substring pattern" is 'AA" of characters within acceptable input. Therefore, In Wupperman, AADAEM does exclusively contain a sequence of characters appearing amongst all characters in AACHEN and in fact only sub-siring "AA" and "E" of AADAEM can be found in AACHEN" a sequence of characters.

Examiner's equation of AA as the sub-string pattern, however, is not consistent with the teachings of Wupperman and in fact directly contradicts the teachings of Wupperman. Plainly, in Wupperman after receiving spoken input, a character-by-character readback of the speech recognized input is provided seeking user confirmation of each character. (See Abstract of Wupperman). Specifically, the Abstract of Wupperman states, "[A]fter the at least partly spelled speech utterance has been entered, the speech recognition unit (2) determines a first recognition result for the whole speech utterance; individually recognized letters are sent to the user for him to acknowledge or reject..." Examiner's cited portion of Wupperman confirms as much in which it is stated,

> In accordance with the sequence 'AA' as acknowledged initial letters, they are assumed to be known, so that both between the nodes K0 and K1 and between the node K1 and the node K2 only one edge is assumed to which is assigned a state corresponding to the letter "A".

Thus, Examiner is incorrect in stating that "AA" in Wupperman is "a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field" as expressly required by all of Appellants' independent claims.

In view of the foregoing, Appellants respectfully submit that the Examiner's rejections under 35 U.S.C. § 102(b) based upon the applied prior art are not viable. Appellants, therefore, respectfully solicit the Honorable Board to reverse the Examiner's rejections under 35 U.S.C. § 102(b).

Date: April 21, 2008

Respectfully submitted,

/Steven M. Greenberg/
Steven M. Greenberg
Registration No. 44,725
Customer Number 46322
Carey, Rodriguez, Greenberg & Paul, LLP
950 Peninsula Corporate Circle, Suite 3020
Boca Raton, FL 33487
Tel: (561) 922-3845
Facsimile: (561) 244-1062

VIII. CLAIMS APPENDIX

1. (Previously Amended) A method for processing string input for a field in an interactive voice response (IVR) system, the method comprising the steps of:

identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

prompting an interacting user for string input limited to said sub-string pattern;

matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,

completing the field with said matched data.

2. (Original) The method of claim 1, wherein said identifying step comprises the step of identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy both a high likelihood of recognition and a high level of uniqueness.

3. (Original) The method of claim 1, wherein said identifying step comprises the step of identifying a sub-string pattern of numeric, alphabetic and alphanumeric characters within acceptable input for the field which is known to enjoy a high likelihood of recognition;

4. (Original) The method of claim 1, wherein said matching step comprises the step of querying a database for all records which have a specified field which contains said received sub-string input.

5. (Original) The method of claim 1, further comprising the step of pre-specifying which characters have a high likelihood of recognition.

6. (Original) The method of claim 1, further comprising the step of pre-specifying a likelihood of recognition value for each of said characters.

7. (Original) The method of claim 1, further comprising the step of, if said matching step produces a set of matching data, each data item in said set matching said sub-string input, disambiguating a desired data item from other data items in said set.

8. (Original) The method of claim 7, wherein said disambiguating step comprises the steps of:

selecting an additional field for processing,

additionally prompting said interacting user for additional input for said additional field;

matching received additional input for said additional prompting with data which conforms to said acceptable input to locate the string input for the field.

9. (Previously Amended) An interactive voice response (IVR) system comprising:

at least one form comprising at least one field which can be completed using input received through the IVR system;

a sub-string analyzer coupled to the IVR system; and,

a search processor coupled both to the IVR system and a database of data configured for searching based upon sub-strings which match sub-string patterns produced by said sub-string

analyzer, the sub-string patterns exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

wherein said at least one field is completed using data matched in said database with said search processor using sub-string input provided through the IVR system.

10. (Original) The system of claim 9, further comprising disambiguation logic.

11. (Original) The system of claim 9, wherein said sub-string analyzer comprises a pre-configuration of computed recognition likelihoods for individual characters for use in forming said sub-string patterns.

12. (Previously Amended) A machine readable storage having stored thereon a computer program for processing string input for a field in an interactive voice response (IVR) system, the computer program comprising a routine set of instructions which when executed by a machine cause the machine to perform the steps of:

identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy a high likelihood of recognition, the sub-string pattern of characters exclusively containing a sequence of characters appearing amongst all characters for the acceptable input for the field;

prompting an interacting user for string input limited to said sub-string pattern;

matching received sub-string input conforming to said sub-string pattern with data which conforms to said acceptable input to locate the string input for the field; and,

completing the field with said matched data.

13. (Original) The machine readable storage of claim 12, wherein said identifying step comprises the step of identifying a sub-string pattern of characters within acceptable input for the field which is known to enjoy both a high likelihood of recognition and a high level of uniqueness.

14. (Original) The machine readable storage of claim 12, wherein said identifying step comprises the step of identifying a sub-string pattern of numeric, alphabetic and alphanumeric characters within acceptable input for the field which is known to enjoy a high likelihood of recognition;

15. (Original) The machine readable storage of claim 12, wherein said matching step comprises the step of querying a database for all records which have a specified field which contains said received sub-string input.

16. (Original) The machine readable storage of claim 12, further comprising the step of pre-specifying which characters have a high likelihood of recognition.

17. (Original) The machine readable storage of claim 12, further comprising the step of pre-specifying a likelihood of recognition value for each of said characters.

18. (Original) The machine readable storage of claim 12, further comprising the step of, if said matching step produces a set of matching data, each data item in said set matching said sub-string input, disambiguating a desired data item from other data items in said set.

19. (Original) The machine readable storage of claim 18, wherein said disambiguating step comprises the steps of:

selecting an additional field for processing,

additionally prompting said interacting user for additional input for said additional field;

matching received additional input for said additional prompting with data which conforms to said acceptable input to locate the string input for the field.

IX. EVIDENCE APPENDIX

No evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 of this title or of any other evidence entered by the Examiner has been relied upon by Appellant in this Appeal, and thus no evidence is attached hereto.

X. RELATED PROCEEDINGS APPENDIX

Since Appellant is unaware of any related appeals and interferences, no decision rendered by a court or the Board is attached hereto.